

CLAIMS

1. An alkaline storage battery comprising: a positive electrode plate; a negative electrode plate; separators interposed between said positive electrode plate and said negative electrode plate; and an alkaline electrolyte,

wherein a first edge of said positive electrode plate and a first edge of said negative electrode plate serve as current collecting portions,

at least a second edge of at least said positive electrode plate is covered with polyethylene resin on an end face and peripheral sides thereof, said second edge being positioned opposite to said first edge, and

said polyethylene resin forming a film on said second edge of said positive electrode plate adheres to said separators positioned on both sides of said positive electrode plate.

2. The alkaline storage battery in accordance with claim 1,

wherein at least said second edge of at least said negative electrode plate is covered with polyethylene resin on an end face and peripheral sides thereof.

3. The alkaline storage battery in accordance with claim 1, wherein said polyethylene resin has a melting point of not higher than 120° C.

4. The alkaline storage battery in accordance with

claim 1, wherein said polyethylene resin film has a thickness of 5 to 50 μm on said end face.

5. The alkaline storage battery in accordance with claim 1,

wherein at least one of said positive electrode plate and said negative electrode plate comprises an electrode core material and an active material layer carried on said electrode core material, and

said second edge covered with said polyethylene resin comprises an exposed portion of said electrode core material not having said active material layer thereon.

6. The alkaline storage battery in accordance with claim 5, wherein a porous metal layer is attached onto said exposed portion of said electrode core material at said second edge.

7. The alkaline storage battery in accordance with claim 6, wherein the thickness of said second edge comprising said exposed portion of said electrode core material and said porous metal layer is 50 to 100% of that of the electrode plate comprising said electrode core material and said active material layer.

8. The alkaline storage battery in accordance with claim 5, wherein the current collecting portion of at least one of said positive electrode plate and said negative electrode plate comprises an exposed portion of said electrode core material not having said active material layer thereon,

and at least the border area between said current collecting portion and said active material layer is covered with polyethylene resin.

9. The alkaline storage battery in accordance with claim 6 or 8, wherein a porous metal layer is attached to said exposed portion of said electrode core material of the current collecting portion, and a part of said porous metal layer is covered by an edge of said active material layer adjacent to said exposed portion.

10. The alkaline storage battery in accordance with claim 5, wherein said electrode core material is made of a metal foil or metal sheet subjected to a lath process or punching process, said metal foil or metal sheet has slits formed in a matrix arrangement, and strips, each of which is positioned between a pair of the slits, are alternately protruded above and below the electrode core material along one direction to form first and second curved protrusions.

11. A method for producing an alkaline storage battery comprising a positive electrode plate, a negative electrode plate, separators interposed between said positive electrode plate and said negative electrode plate, and an alkaline electrolyte solution, said method comprising the steps of:

(a) producing a positive electrode plate having a current collecting portion at a first edge thereof and a negative electrode plate having a current collecting portion

at a first edge thereof;

(b) covering at least a second edge of at least said positive electrode plate with polyethylene resin on an end face and peripheral sides thereof, said second edge being positioned opposite to said first edge;

(c) winding spirally or laminating said positive electrode plate and said negative electrode plate with said separators interposed therebetween to produce an electrode assembly; and

(d) heating said second edge having said polyethylene resin carried thereon to allow said polyethylene resin forming a film to adhere to said separators disposed on both sides thereof.

12. The method for producing an alkaline storage battery in accordance with claim 11, wherein said step (b) comprises a step of applying an aqueous dispersion of polyethylene resin onto said end face and peripheral sides.

13. The method for producing an alkaline storage battery in accordance with claim 12, wherein said step of applying an aqueous dispersion of polyethylene resin onto said end face and peripheral sides comprises the steps of:

continuously supplying said aqueous dispersion of polyethylene resin to the surface of a rotating roller from one direction to form a coating film having a given thickness on the roller surface;

shifting said electrode plate disposed perpendicular

to said roller surface toward a direction tangent to said roller surface while said end face and peripheral sides are in contact with said coating film.

14. The method for producing an alkaline storage battery in accordance with claim 12, wherein said aqueous dispersion of polyethylene resin contains methyl cellulose dissolved therein as a thickener and an anti-settling agent for polyethylene resin.

15. The method for producing an alkaline storage battery in accordance with claim 11, wherein said step (a) further comprises the steps of:

applying a paste containing a metal powder and a thickener along at least said second edge, which is opposite to said first edge, of an electrode core material;

drying and sintering said paste to form a porous metal layer; and

allowing said electrode core material to carry an active material layer thereon except at least said first edge and said second edge.

16. The method for producing an alkaline storage battery in accordance with claim 15, wherein said step (a) further comprises the steps of:

applying said paste along said first edge of said electrode core material; and

drying and sintering said paste to form a porous metal layer.